REMARKS

The present response is intended to be fully responsive to all points of objection and/or rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application is respectfully requested.

Applicants assert that the present invention is new, non-obvious and useful. Prompt consideration and allowance of the claims is respectfully requested.

Status of Claims

Claims 1-38 are pending in the application.

Claims 1-32 have been rejected.

Claims 1, 8-10, 17-19, 24 and 27 have been amended in this submission. Applicants are aware that the application is under final rejection; however, as shown below, the amendments are intended to place the claims in condition for allowance. In particular, the amendments to the claims are either formal only in nature or add material that was presented in dependent claims or previously considered by the Examiner.

Therefore, Applicants respectfully request that the Examiner consider the amended claims on the merits. The amendments include the following:

- Claims 1, 10 and 19 have been amended to include that first and second images differ in at least one optical property, e.g., polarization or wavelength.
- Claims 1, 8, 10, 17 and 19 recite that the first and second images are viewed together by an eye of the viewer. It should be noted that this feature can not be said to exist with respect to stereoscopy.
- Claims 8 and 17 have been amended to incorporate all limitations of claims 1 and 10, respectively from which they previously depended.

- Claims 9, 18, 24 and 27 have been amended to amend the identity of the claim from which they depend.

In addition, claims 33-38 have been newly added in this submission. Such claims are dependent on existing claims and do not require new search.

Finally, Applicants are grateful to the Examiner for pointing out the duplication of claim 5 and claim 7. This was due to typographical error in the previous amendment. Accordingly, claim 7 has been returned to its previously presented form.

The above amendments have not been made for purposes of overcoming prior art, but rather to clarify the claims; accordingly, no narrowing of the scope of the claims is intended or accomplished by such amendments.

Applicants respectfully assert that the new and amended claims add no new matter.

CLAIM REJECTIONS

35 U.S.C. § 112 Rejections

First, in the Office Action, the Examiner rejected claims 6, 9, 15, 16, 18, 24 and 27 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. In particular, the Examiner inquired how a redirecting unit can be a polarization selective reflective device capable of "directing at least said first and second images to at least first and second respective spatial regions of a reflecting unit."

The rejection is respectfully traversed, insofar as such devices are (and were at the time of filing of the present application) well known to those of ordinary skill in the art. First, Applicants respectfully direct the Examiner's attention to page 7 of the specification, where it is stated that in one embodiment of the invention, "image redirector 40 . . . is embodied by an optical device 92 (such [as] a wedge with two polarization-dependent reflective planes)." Such a wedge having two polarization-dependent reflective planes, each for reflecting light of a different polarization, would operate to direct light polarized differently in different directions.

The practical and theoretical bases for such an element described in the embodiment are well known in the art. For example, attached as Appendix A are pages 331-335 of a 1965 Edition of Applied Optics and Optical Engineering, by Rudolf Kingslake. In these pages, polarization by double refraction is described, for example by use of a Rochon or Wollaston prism.

Other devices are known in the art for such purposes and commercially available. For example, Applicants attach hereto as Appendix B, pages 234-235 of a 1998-99 catalog for laser and photonics applications from Coherent, which offer for sale polarizing beamsplitting cubes and prisms. As explained therein, the effect of such devices is to receive an incoming beam and divide it into its component polarized components. Any of these devices would take a beam of a first polarization and direct it in a first direction and direct a second beam of a second polarization in a second direction.

Next, the Examiner inquired how an image source can be capable of generating spatially complementary images of different wavelengths or of different polarizations.

In response, Applicants respectfully direct the Examiner to page 7 of the specification, where Applicants state that in one embodiment of the invention, image source may be "one common display (such as with a LCD display). The image source may be any type of display technology using P&S polarizers or LCD technology (such as from: Sony, Sharp, Kopin, MicroDisplay and others). . ." It is well known that a liquid crystal display (LCD) polarizes the polarization of an incoming light beam by 90°. Accordingly, allowing a polarized image to pass the LCD without electro-optic modulation would produce an image having a first polarization. Alternatively, taking the polarized image and electro-optically modulating it would produce an image having a second polarization orthogonal to the first.

With respect to the Examiner's inquiry regarding producing images having different wavelength, it is also known that an LCD may produce multiple colors (such as in today's laptop computers). Accordingly, in one embodiment of the invention, by using the same LCD image source to produce different colored images in time sequence, different wavelength images may be formed.

Finally, the Examiner inquired how the wavelength sensitive redirecting unit can be capable of directing first and second complementary images to different spatial locations according to wavelength.

This element, too, is well known in the art. The Examiner is respectfully reminded that a prism does precisely this – direct beams of light having different wavelengths to different places. Hence, when white light enters a prism, the component colors (wavelengths) emerge at different angles, i.e., to different spatial locations.

Accordingly, based at least on the above arguments, it is respectfully asserted that the specification does indeed enable the claims, and the Examiner's rejections based on 35 U.S.C. § 112, first paragraph, are traversed.

35 U.S.C. § 103 Rejections

Morishima and Popovich

In the Office Action, the Examiner rejected claims 1-7, 10-15, 19-23, 24-29 and 31-32 as unpatentable under 35 U.S.C. § 103(a) over USPN 5,589,956 (Morishima) in view of USPN 6,082,862 (Popovich).

As explained in a previous submission, the primary reference, Morishima teaches "[a]n image display apparatus includes a plurality of image display elements respectively assigned to different partial image information regions of an image to be displayed . . ." (Abstract). As Applicants pointed out previously, Morishima describes a device wherein "two LCDs 1-1 and 1-2 [of Fig. 10] are arranged. A reflection type HOE 2a is constituted by connecting two different elementary HOEs 2a-1 and 2a-2." (col. 9 lines 27-30). Furthermore, Morishima describes directing the images along separate paths to their separate ultimate destinations. Thus, Morishima does not disclose, teach, suggest or imply an image source to produce at least first and second complementary images along a common optical axis, as recited in the claims.

In the present Office action, the Examiner has conceded that Morishima does not teach producing the complementary images along a common optical axis.

As a secondary reference, the Examiner has brought Popovich, which teaches "[a] projection system and a method displaying a high resolution composite image on a projection screen include a number of reconfigurable holographic optical elements (HOEs) in the projection optics of the system. The reconfigurable HOEs of the projection optics allow the system to direct multiple image segments of the composite image that are projected from a single image source toward different regions of the projection screen to form the composite image on the screen." (Abstract)

The Examiner states that it would have been obvious to modify Morishima "for the benefit of using a single image generating source that generates image portion along a common axis as desired to reduce the size of the image source." However, this argument for obviousness suffers from the classic flaw of hindsight.

Specifically, it is well-recognized that in order to avoid the pitfall of finding the invention in the prior art by the benefit of hindsight, the burden is on the Examiner to find a suggestion for modifying a reference in the reference itself or in the general state of the art. In this case, the Examiner has pointed out the benefit of using a single image-generating source and the common optical axis of claims 1, 10 and 19. However, there is no nothing in the Morishima reference to suggest or point in this direction. Morishima does not recite any drawbacks of using multiple image sources to project images on separate optical paths. In fact, the whole of the Morishima reference is based on using "a plurality of image display elements." (Abstract). Thus, to replace the invention of Morishima with an image source to project complementary images along a common optical axis would eliminate the very essence of Morishima's invention. The technologies of Morishima and Popovich are simply incompatible. The Examiner has modified the reference in pure impermissible hindsight to reconstruct the present invention.

Therefore, it would not have been obvious to one or ordinary skill in the art to modify Morishima in view of Popovich. Accordingly, claims 1, 8, 10, 17 and 19, and the claims dependent thereon, are patentable over Morishima in view of Popovich.

Florence

In the Office Action, the Examiner rejected claims 1, 8, 10 and 17 as unpatentable under 35 U.S.C. § 103(a) over USPN 5,652,666 (Florence).

Florence teaches "[a] method of using a display system having a spatial light modulator (14) to display holographic images. The spatial light modulator (14) generates images that represent vertical strips of a hologram. These images are de-magnified by a three-dimensional optics unit (18), in the horizontal direction so as to form image strips. A scanning mirror (45) scans the image strips in a series across an image plane at a rate sufficiently fast that the viewer perceives a composite hologram comprised of these image strips." (Abstract).

The Examiner has stated in the Office action that Florence teaches producing first and second complementary images, and furthermore that such complementary images are produced along a common optical axis. Applicants respectfully disagree.

First, Florence teaches using an image source to produce only a single image, not first and second images. Florence's image source only produces one image, whereas in the present claims, the image source produces at least first and second images.

Phrased differently, the purpose of Florence is entirely different from the present claims. Because Florence's image source only displays one image, the resulting image seen by the eye has the same field of view as the image source. In contrast, because the image source of the present claims displays first and second complementary images, the resultant image seen by the eye has a field of view greater than the field of view of the image source.

Secondly, the image source of Florence does not produce first and second complementary images along a common optical axis. If the Examiner's position is that the single image produced by Florence's image source comprises first and second complementary images, then such first and second images do not travel along a common optical axis, but along separate and distinct optical axes, as with Morishima, which the Examiner concedes does not include this aspect of the claim.

Therefore, for at least the reasons stated above, Florence does not render obvious claims 1, 8, 10, 17 and 19. Accordingly, all independent claims and the claims dependent therefrom are patentable over Florence.

Popovich

In the Office Action, the Examiner rejected claims 1, 6, 7, 10, 14-15, 19, 24-29 and 31-32 as unpatentable under 35 U.S.C. § 103(a) over USPN 6,082,862 (Popovich).

Popovich teaches "[a] projection system and a method displaying a high resolution composite image on a projection screen include a number of reconfigurable holographic optical elements (HOEs) in the projection optics of the system. The reconfigurable HOEs of the projection optics allow the system to direct multiple image segments of the composite image that are projected from a single image source toward different regions of the projection screen to form the composite image on the screen." (Abstract).

That is, Popovich teaches using a single image generating device to sequentially produce multiple complementary images that are indistinguishable by their optical properties (such as color and polarization), and coordinating the generation of the complementary images with the HOE's to direct the images to their place on the screen.

The teaching of Popovich, therefore, is is entirely different from the claims of the present invention. According to the present claims, the apparatus may produce first and second complementary images having different optical properties, e.g., polarization and/or wavelength (amended claims 1, 10, 19). Further, the device may direct the images differently based on differing optical properties, e.g., different polarization and/or wavelength. It should be noted that the complementary images of Popovich are not directed based on wavelength, insofar as each complementary image is comprised of the same identical colors.

In view of the foregoing amendments and remarks, the amended independent claims 1, 8, 10, 17 and 19, and claims depending therefrom, are deemed to be in condition for allowance. Their favorable reconsideration and allowance is respectfully requested.

In view of the above each and every pending claim is deemed to be patentable over the art of record. Prompt allowance of all claims is therefore requested.

Should the Examiner have any question or comment as to the form, content or entry of this Amendment, the Examiner is requested to contact the undersigned at the telephone number below. Similarly, if there are any further issues yet to be resolved to advance the prosecution of this application to issue, the Examiner is requested to telephone the undersigned counsel.

Please charge any fees associated with this paper to deposit account No. 05-0649.

Respectfully submitted,

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